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BY

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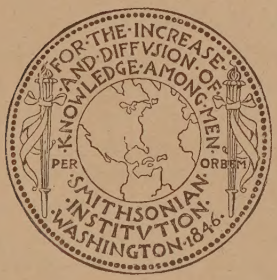

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A REVIEW OF THE FISHES OF THE FAMILY GERRIDÆ FOUND IN THE WATERS OF JAPAN.

By David Starr Jordan,

Of Stanford University, California.

In this paper is given an account of the species of fishes belonging to the family Gerridæ found in the waters of Japan. It is based on the collections of Professors Jordan and Snyder, series of which are in the United States National Museum. The species, two in number, are known to the Japanese as Kurosagi (*kuro*, black, *sagi*, heron, the same word used for smelt).

Family GERRIDÆ.

Body oblong or elevated, compressed, covered with large, smooth scales; lateral line continuous, concurrent with the back; mouth moderate, extremely protractile, descending when protruded, the spines of the premaxillary extending to above eye, closing a deep groove in the top of head; maxillary without supplemental bone, not slipping under the very narrow preorbital, its surface silvery, like the rest of the head; base of mandible scaly, a slit between it and the preorbital to permit its free motion; jaws each with slender, villiform teeth; no incisors, canines, nor molars; no teeth on vomer or palatines; preopercle entire or serrate; sides of head scaly; nostrils double, round; pseudobranchiæ concealed; gillrakers short, broad; gill-membranes separate, free from the isthmus; dorsal fin single, continuous or deeply notched, the spinous and soft portions about equally developed, with a scaly sheath along the base; dorsal spines 9 or 10; anal with 2, 3, or 5 spines, usually with 3 spines, the soft portion of the fin similar to the soft dorsal, but shorter; ventral fins thoracic, 1, 5, rather close together, slightly behind pectorals, branchiostegals 6; lower pharyngeal bones close together, often appearing to be united; the teeth blunt; air-bladder present; pyloric cœca rudimentary; vertebræ $10 + 14 = 24$. Oviparous. Carnivorous fishes of moderate size inhabiting sandy shores of tropical and subtropical seas.

KEY TO GENERA.

a. GERRINÆ. Dorsal fin continuous, deeply notched; anal spines, 3 or 2.
b. Second interhæmal spine normally developed, not forming a hollow cylinder, the air-bladder not entering it, but its tip forking, extending on each side of it.
c. Second interhæmal spine long, spear-shaped, anal spines 3.
d. Preopercle entire; second anal spine moderate.
e. Dorsal spines, 9 ..... *Xystæma*, 1
ee. Dorsal spines, 10 ..... *Gerreomorpha*, 2

1. XYSTÆMA Jordan and Evermann.

Xystœma JORDAN and EVERMANN, Proc. Cal. Ac. Sci., 1895, p. 471 (*cinereus*).

This genus differs from *Gerres* in having the preopercle entire. The body is compressed, but not greatly elevated, and the second anal and fourth dorsal spines are less enlarged than in *Gerres*. Dorsal spines always 9; anal spines, 3. The second interhæmal is long and spear-shaped, not hollow, and not receiving the air-bladder, its structure as in *Gerres*. Usually the air-bladder is forked, passing on each side of the interhæmal spine. Species numerous, chiefly Asiatic, only the type-species being American.

(ξυστόν, spear-shaft; αἷμα, blood, for interhæmal.)

1. XYSTÆMA ERYTHROURUM (Bloch).

KUROSAGI (BLACK SMELT), AMAGI (SWEET-FISH), SIJUGARA (CHICKADEE.)

Sparus erythrourus BLOCH, Ichth, VIII, 1790, p. 23, pl. CCLXI (Japan).
Gerres equula SCHLEGEL, Fauna Japonica, Poiss., 1843, p. 76, pl. XL, fig. 1 (Nagasaki).—BLEEKER, Nieue Nalez, Japan, XXV, 1857, p. 92 (Nagasaki).
? *Gerres japonicus* GÜNTHER, Cat., IV, 1862, p. 260 (Amoy; Canton. Said to have D. IX, 10). (Not of Bleeker.)
? *Gerres japonicus* RUTTER,[a] Proc. Ac. Nat. Sci., Phila., 1897, p. 76 (Swatow, China).
Xystæma oyena SMITH and POPE, Proc. U. S. Nat. Mus., XXXI, 1906, p. 478 (Yamagawa, near Kagoshima). (Not of Forskål).

Habitat.—Southern Japan, perhaps southward to China, common in sandy bays northward to Wakanoura.

Head $3\frac{1}{2}$ in length; depth $2\frac{5}{6}$ to 3; D. IX, 10; A. III, 8; eye 3 to $3\frac{1}{3}$ in head; scales ~~$4\frac{1}{2}$–44~~–9.

Body elliptical-compressed, rather more elongate and less angular than usual in *Xystæma;* silvery part of maxillary about twice as long as deep; groove on top of head short, obtuse behind; dorsal rather low, its longest spine $1\frac{2}{5}$ to $1\frac{3}{5}$ in head; second anal spine 3 to $3\frac{1}{3}$ in head; pectoral as long as head; ventral $1\frac{1}{2}$ in head; distance from ventral base to anal greater than length of head; gillrakers very short and sharp, 5+7.

[a] This specimen having the depth $2\frac{2}{3}$ in length, the anal spine $\frac{2}{3}$ depth of body, must belong to a distinct species, perhaps *Xystæma oyena*.

Color silvery, rather darker above than usual; faint dark shades along bases of soft dorsal rays; tip of spinous dorsal black; tips of ventrals more or less dusky; axil of pectoral rarely entirely pale, usually dark; ventrals and front of anal yellow in life.

Of this species, common on sandy shores throughout southern Japan, we have many specimens from Nagasaki, Wakanoura, and Oita, in Bingo. It is an elongate species, with the back dusky and the fin spines

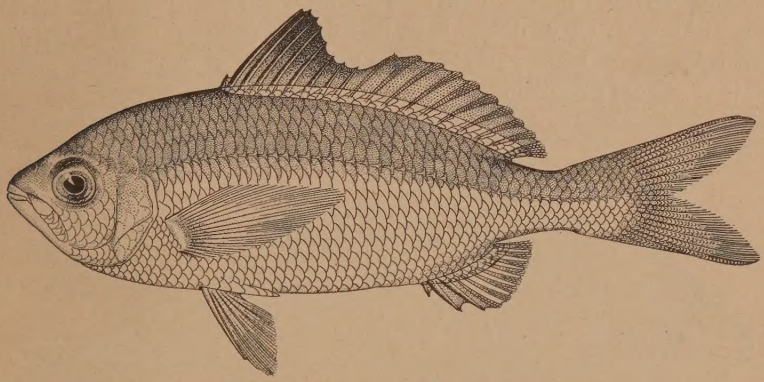

FIG. 1.—XYSTÆMA ERYTHROURUM.

low. It has been confounded with *Xystæma oyena* (Forskål), of India and Arabia, but it is apparently distinct. The latter is a deeper fish, with the caudal dusky behind and the ventrals pale.

(*ἐρυθρός* red; *οὐρά* tail, which is not the case; Bloch's type was doubtless discolored.)

2. GERREOMORPHA Alleyne and Macleay.

Gerreomorpha ALLEYNE and MACLEAY, Proc. Linn. Soc. N. S. W., I, 1876, p. 274 (*rostrata*).

This genus differs from *Xystæma*, and from all other *Gerridæ*, in having ten dorsal spines instead of nine. The type is Australian. *Gerreomorpha setifera* (Hamilton-Buchanan) is an Indian species of this genus.

(Gerres; *μορφή*, form.)

2. GERREOMORPHA JAPONICA (Bleeker).

Gerres japonicus BLEEKER, Nieue Nalez, Japan, 1857, p. 93, pl. v (Nagasaki).—NYSTRÖM, Svensk. Vet. Ak. Handl., 1887, p. 12 (Nagasaki).

Xystæma japonicum SMITH and POPE, Proc. U. S. Nat. Mus., XXXI, 1906, p. 478 (Kochi; Urado).

Habitat.—Bay of Waka, to Nagasaki and southward to the Riu Kiu Islands; rare.

Head $3\frac{2}{5}$ in length; depth $2\frac{3}{5}$; eye $3\frac{1}{3}$ in head; D. X, 9; A. III, 7; scales $5\frac{1}{2}$–42–9.

Body deeper and more angulated than in *Xystœma erythrourum;* groove of premaxillary short, obtuse behind; silvery part of maxillary about half longer than deep; snout not projecting; outline of lower jaw slightly concave; longest dorsal spine $1\frac{3}{5}$ in head; longest anal spine $2\frac{4}{5}$; pectoral as long as head.

Color silvery, darker above, with faint darker streaks along the rows of scales; tip of dorsal blackish; axil of pectoral dusky; ventrals not tipped with black; ventrals and membranes of anal spines yellow in life; caudal greenish.

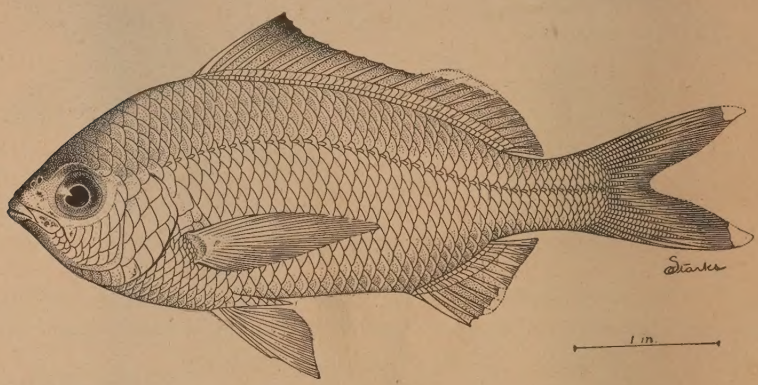

FIG. 2.—GERREOMORPHA JAPONICA.

Of this species we have examined three specimens, two from Naha in the Riu Kiu Islands, presented by the Imperial University. The other was taken by Messrs. Jordan and Snyder at Wakanoura. The species may be known at once by the very silvery coloration, by the rather deep body and by the character, called generic, of the ten dorsal spines.

SUMMARY.

Family GERRIDÆ.

1. *Xystœma* Jordan and Evermann, 1895.

1. *erythrourum* (Bloch) 1790; Wakanoura, Oita, Nagasaki.

2. *Gerreomorpha* Alleyne and Macleay, 1876.

2. *japonica* (Bleeker) 1857; Wakanoura, Naha (Riu Kiu Islands).